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TECHNICAL MEMORANDUM REGARDING RECOMMENDATION FOR MERCURY SAMPLING SITE 40 NAS PENSACOLA FL

6/27/2001

ENSAFE/ALLEN AND HOSHALL

Technical Memorandum

Naval Air Station - Pensacola, Florida

To: NAS Pensacola Partnering Team

From: EnSafe Inc.

Date: June 27, 2001

Subject: Recommendation for Mercury Sampling, Site 40 and Wetland 64

In the Tier 1 Partnering Meeting of October 24 and 25, 2000, the Tier 1 Team developed a sampling scheme to address mercury contamination in Level 3 fish in Bayou Grande (Site 40), Operable Unit 15 at the Naval Air Station Pensacola. Because similar concerns needed to be addressed at Wetland 64 of Site 41, it was later agreed to add Wetland 64 to this investigation. The objective of the sampling is to reduce the uncertainty within the Upper Trophic Level Fish Model (i.e., transfer of mercury from prey fish to predatory fish) by developing a site-specific biota sediment accumulation factor (BSAF). The BSAF will be calculated using results from co-located sediment and Level 3 fish samples. This document summarizes the sampling rationale, locations, and techniques that were discussed and approved by the Tier 1 Team at the October meeting as well as locations at Wetland 64. The Team also agreed that Level 4 fish would not be collected because of the added uncertainties associated with their home ranges.

Sampling Locations

The mercury and total organic carbon (TOC) results presented in the Site 40 Remedial Investigation (RI) Report, and the Wetland 64 section in the Site 41 RI Report were evaluated to select locations for the BSAF sampling. Data from the two RI reports were compared by sample location to find locations representing low-to-high ranges of mercury and TOC concentrations at each site. Information provided by the National Oceanographic and Atmospheric Administration (NOAA) indicated that the average TOC concentration for the continental United States is 1%. The mean TOC concentration for Bayou Grande is 4.2%. Based on the NOAA and site data, Table 1 lists the criteria established for TOC content for Site 40 and Wetland 64:

Table 1 TOC Ranges		
Range	**Site 40**	**Wetland 64**
Low	< 1%	< 1%
Medium		1-4%
High	> 1%	> 4%

Mercury concentrations were also evaluated and the following criteria were established to represent low, medium, and high TOC concentrations, as shown in Table 2:

Table 2 Mercury Ranges		
Range	**Site 40**	**Wetland 64**
Low	ND	ND
Medium	0.3 ppm	0.3 ppm
High	> 0.3 ppm	> 0.3 ppm

A matrix was subsequently developed for Site 40 and Wetland 64 which compared TOC and mercury data from each site to find sample locations meeting the above criteria. For Site 40, data did not indicate a location for low TOC/high mercury concentrations; therefore, a second sample representing the mean detected concentrations of TOC and mercury was selected. In addition, the two Site 40 locations with the highest mercury detections were selected for sampling. A background sample for the purpose of comparison will also be collected from an area of Bayou Grande that is upstream from NAS Pensacola. Because upstream TOC data for Bayou Grande are not currently available, the sample location will be biased to an area of fine sediment based on visual observations. For Wetland 64, locations were not found for combinations of low TOC and high mercury concentrations or medium TOC and high mercury concentrations. All other combinations for Wetland 64 were found. A total of seven sample locations were selected for Site 40, and seven locations were also selected for Wetland 64. The completed matrix is provided in Table 3. Figure 1 shows the sample locations for Site 40, while Figure 2 shows the locations for Wetland 64.

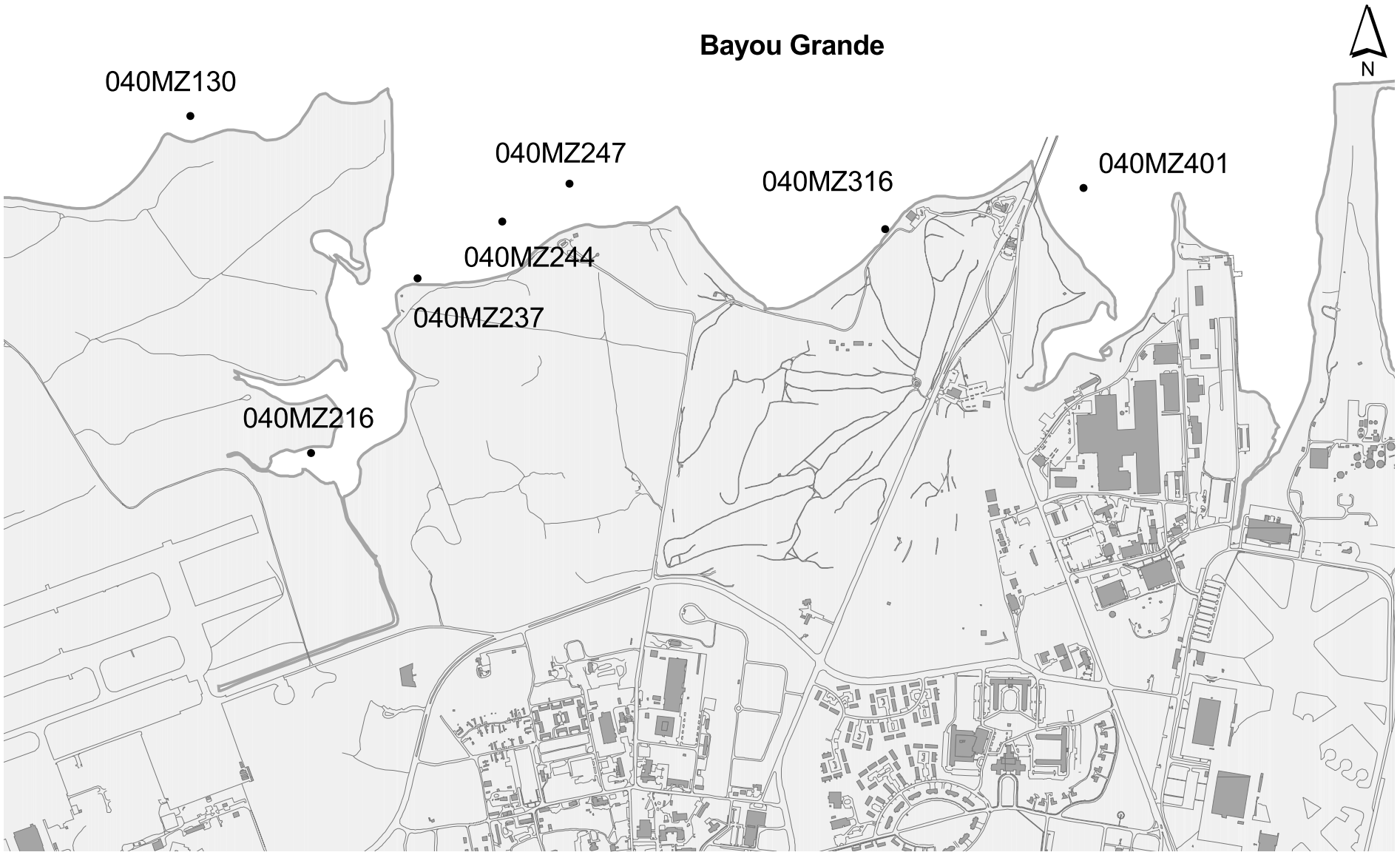

Figure 1
Sample Locations, Site 40 BSAF Sampling
Naval Air Station Pensacola
Pensacola, Florida

1000 0 1000 2000 Feet

● Sample Locations

6/27/2001 //gissafe/projects/pcols/bsaf.apr/ly2

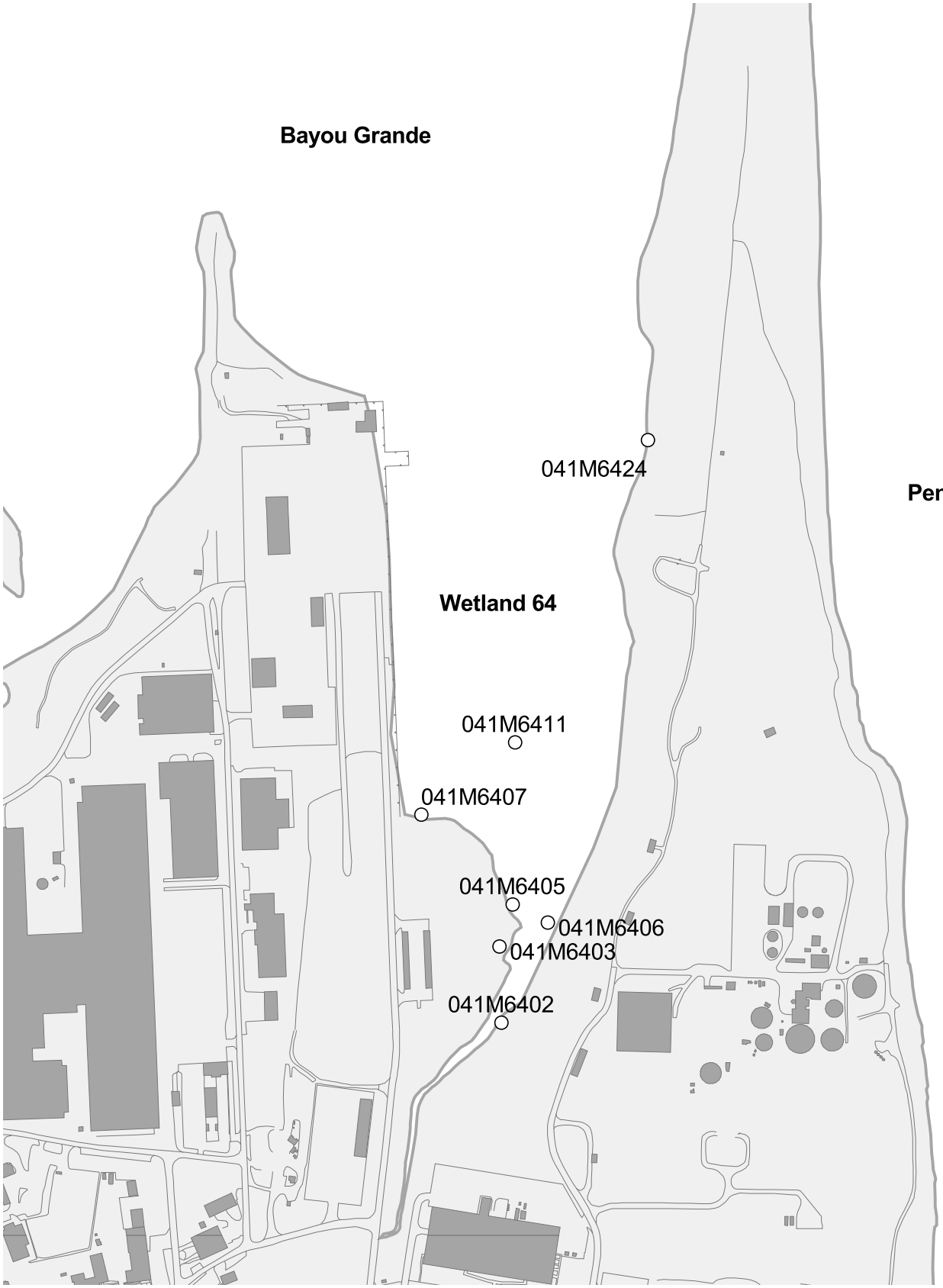

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Figure 2
Sample Locations, Wetland 64 BSAF Sampling
Naval Air Station Pensacola
Pensacola, Florida

200 0 200 400 Feet

○ Sample Locations

6/27/2001 //gissafe/projects/pcola/bsaf.apr/ly1

Table 3
Mercury and TOC Matrix

Site 40				
Matrix Combinations		**TOC Concentrations**		
		Low	**Medium**	**High**
Mercury Concentrations	**Low**	040MZ237 TOC — 0.15% Hg — 0.8 ppm	N/A	040MZ401 TOC — 5.6% Hg — ND
	Medium	040MZ316 TOC — 0.09 Hg — 0.14	040MZ216 TOC — 7.2% Hg — 0.28 ppm	040MZ247 TOC — 4.0% Hg — 0.28 ppm
	High	N/A	040MZ244 TOC — 3.9% Hg — 0.64 ppm	040MZ130 TOC — 3.9% Hg — 2.2 ppm
Wetland 64				
Matrix Combinations		**TOC Concentrations**		
		Low	**Medium**	**High**
Mercury Concentrations	**Low**	041M6407 TOC — 0.48% Hg — 0.1 ppm	041M6406 TOC — 2.81% Hg — 0.12 ppm	041M6402 TOC — 4.42% Hg — 0.17 ppm
	Medium	041M6424 TOC — 0.74% Hg — 0.3 ppm	041M6411 TOC — 4.01% Hg — 0.3 ppm	041M6405 TOC — 8.35% Hg — 0.27 ppm
	High	N/A	N/A	041M6403 TOC — 19.4% Hg — 0.88 ppm

Notes:
N/A = Not applicable.
ppm = Parts per million (ppm) or milligrams per kilogram (mg/kg).

Sampling Method

A Global Positioning System (GPS) survey unit will be used find the appropriate coordinates for the Site 40 and Wetland 64 sample locations noted in Table 3, allowing the BSAF samples to be co-located with the previous sample locations. Sediment samples will be collected using the appropriate means (Eckman dredge, Ponar dredge, stainless-steel scoop, etc.), depending on water depth and site accessibility. A polygon pattern with three sampling points situated approximately 10-yards apart will be established at each sample location. At each of the three sampling points,

three sediment samples (0-6 inches in depth) will be collected and composited for TOC and mercury analysis. One bait trap will also be deployed at each location for fish collection. Dry dog food will be used as bait for the traps (a sample of which will be collected for laboratory analysis). Fish will be collected for whole-body analysis (for lipid content and mercury) at an appropriate laboratory. The target fish species for trapping is the Gulf killifish *(Fundulus grandis)*. The fish collected in the trap will be examined in the field, with the largest organisms selected for analysis. While killifish are preferred for analysis, but pinfish *(Lagodon rhomboides)* will be used if they are the only fish available. A seine may be used as an alternate fish sampling technique if the bait traps are not effective. As suggested by USEPA in the May 30, 2001 NAS Pensacola Partnering Meeting, the collected fish will be retained in a tank for at least 24 hours before shipment to the laboratory to allow time for undigested food to pass through their system.

Sample Handling

Samples will be handled, labeled, packaged and shipped in accordance with the procedures contained in the Comprehensive Sampling and Analysis Plan (EnSafe/Allen & Hoshall, July 1994).

Laboratory Analysis

Sediment samples will be submitted to the selected laboratory for mercury (Low Concentration SOW CLP 10/91) and TOC (Walkley Black) analyses. Fish samples will be submitted for mercury and lipid content analyses. TOC and lipid content will be analyzed at Level II data quality and mercury will be analyzed at Level III data quality. All samples will be analyzed with a 28-day turnaround.

Reporting

The data collected will be used to develop a site-specific BSAF. The BSAF will then be input into the Upper Trophic Level Fish Model contained in the *Site 40 Final Remedial Investigation Report* (EnSafe Inc., January 20, 1999 with errata dated April 24, 2000) and risk to Level 4 fish will be calculated. The same fish model will be used to update the protection of fish viability discussion

for Wetland 64 in the *Site 41 Final Remedial Investigation Report* (EnSafe Inc., August 31, 2000). Errata pages for the Site 40/41 RI reports will be submitted to update the models for each report.